MODEL 00HC-2016, 00HC-2017, 00HC-2018, 00HC-2046, 00HC-2047 & 00HC-2048

OPERATION & MAINTENANCE MANUAL

Manufactured With Pride
In The USA

www.ameriwater.com • 800-535-5585

AmeriWater • 1303 Stanley Avenue • Dayton, OH 45404

98-0106
Rev J

TABLE OF CONTENTS

SECTION 1, GENERAL INFORMATION 1

1.1 INTRODUCTION 1
1.2 ELETRICAL LEAKAGE STANDARDS 2
1.3 CAUTIONARY SYMBOLS 3

SECTION 2, TECHNICAL INFORMATION 4

2.1 THEORY OF OPERATION 4
2.2 SPECIFICATIONS 5
2.3 SPECIFIC ENVIRONMENTAL/TRANSPORT CONDITIONS ANTICIPATED 6
2.4 TEMPERATURE CORRECTED RO2 PRODUCTION RATES 7

SECTION 3, COMPONENTS AND SCHEMATICS 8

3.1 RO2 EXTERNAL FRONT VIEW 8
3.2 RO2 INTERNAL REAR VIEW 10
3.3 DI POLISHER EXTERNAL FRONT VIEW 12
3.4 STORAGE TANK 14
3.5 ELECTRICAL DIAGRAM 18
3.6 SIDE ENTRY HOOD 18
3.7 FLUID DIAGRAM 19

SECTION 4, INSTALLATION 20

4.1 GENERAL INSTALLATION INSTRUCTIONS 20
4.2 RO2 INSTALLATION 20
4.3 DI POLISHER 21
4.4 STORAGE TANK 22

SECTION 5, SYSTEM START-UP 23

5.1 PT401 PRIMING PROCEDURE 25
5.2 REFILLING PT401 26
5.3 PT401 ANTISCALANT SETTINGS 26

SECTION 6, OPERATION 27

6.1 OPERATION 27
6.2 BYPASS PROCEDURE 27

SECTION 7, MONITORING 28
SECTION 8, MAINTENANCE 29

8.1 RO2 NORMAL MAINTENANCE ITEMS 29
8.2 DI POLISHER RESIN PACK EXCHANGE 31
8.3 DI POLISHER RESIN PACK REGENERATION 32

SECTION 9, ALARMS 33

9.1 RO2 OPERATING STATUS MESSAGES & ALARMS 33
9.2 DI POLISHER ALARMS 33

SECTION 10, STANDARD SETPOINT TABLE 34
SECTION 11, OPTIONAL DISINFECTION 35

11.2 A WORD ABOUT HYDROGEN PEROXIDE/PEROXYACETIC ACID 37
11.3 SILEX DISINFECTION 38
11.4 TANK DISINFECTION 39

SECTION 12, CLEAN IN PLACE (CIP) 40
SECTION 13, TROUBLESHOOTING GUIDE 42
SECTION 14, SPARE PARTS LIST 47

SECTION 1, GENERAL INFORMATION

1.1 INTRODUCTION

This system is designed to pretreat and purify water for use in health care applications. The 00HC2046 system is shipped completely assembled with required water treatment components. This Operation Manual was written specifically for the RO2 model, storage tank and DI polisher. Your system was thoroughly tested and in excellent condition when it was shipped to you. However, because damage during shipment is possible, please unpack and carefully inspect the system as soon as you receive it. Please notify AmeriWater if any problems are encountered.

Please read the Operations Manual before using the system. Contact AmeriWater Customer Service with any questions at 1-800-535-5585 Monday through Friday 8:00 a.m. to 5:00 p.m. eastern standard time. For after hours emergencies call 1-800-535-5585 and follow the instructions on the recorded message. Our on-call technician will return your call as soon as possible. This entire Operations Manual should be read before operating or servicing the system. This Operations Manual should then be kept near the system and used as a reference and troubleshooting guide.

Materials that Contact Product Water:

ABS	Acrylic	Carbon	EPDM
Nylon	Polyester	Polyethylene	Polypropylene
PVC	Stainless Steel	TFCM* (Polyimide)	Tygon

*Thin Film Composite Membrane
All of the above listed materials meet FDA and/or NSF standards.

Life Expectancy of Components:

The 2 Carbon Cartridge Filters will last for up to 200 hours depending upon the content of the incoming water. These should be changed whenever chloramines breakthrough occurs.

The PT401 anti-scalant should be refilled every 200 hours as well.

DI resin packs should be changed whenever the quality indicator light changes from green to red.

Safety Features

The RO2 is equipped with several safety features for the benefit the user. They consist of the following:

Color-coded inlets and outlets are on the membrane assemblies to avoid mix-ups.

INCOMING TAP WATER, PRODUCT WATER, and REJECT WATER TO DRAIN hoses are labeled to prevent incorrect connections.

An audible alarm sounds whenever water quality drops to an unacceptable level.

1.2 ELETRICAL LEAKAGE STANDARDS

The AmeriWater RO2 water treatment system complies with the National Electrical Standards for Product Safety and Construction.

During the design process the individual components were tested and the initial test results for the electrical components (pump, solenoid valves, and controller) were all less than 0.1 microampere leakage.

Completed product testing with the RO2 functioning resulted in the following RO2 standards being set.

TEST PERFORMED	ROS ELECTRICAL LEAKAGE STANDARD	ANSI / AAMI SAFE LIMITS STANDARDS
Normal Polarity	<10 microamperes	100 microamperes
Neutral Open (single fault)	<100 microamperes	500 microamperes
Ground Open (single fault)	<100 microamperes	500 microamperes
Ground & Neutral Open *	<200 microamperes	Not Required

* Although this test is not required by ANSI/AAMI, it is still performed as an additional safety measure.

The cabinet of the RO2 is PVC plastic for additional operator safety.

The RO2 is compliant with ANSI/AAMI ESI-1993, Safe Current Limits for Electro medical Apparatus. All major components of the ROS (controller, pump, solenoid valve, antiscalant pump) as well as other components are UL listed.

This product has been tested to the requirements of CAN/CSA-C22.2 No. 61010-1, second edition, including Amendment 1, or a later version of the same standard incorporating the same level of testing requirements.

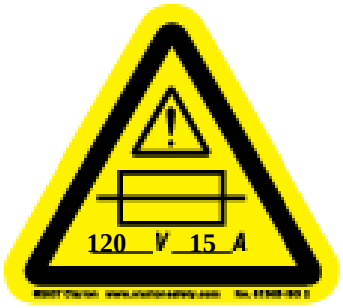
Product marked with this symbol indicates that it is protected throughout by double insulation or reinforced insulation.

1.3 CAUTIONARY SYMBOLS

Caution, risk of electrical shock!
Attention, risque de choc électrique!

Open by qualified service personnel only!
Ouverture par le personnel qualifié seulement!

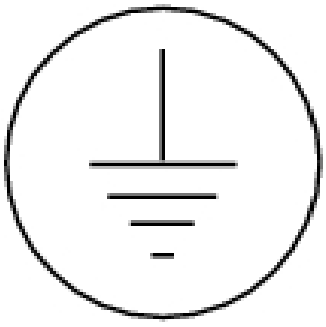
Refer to this Operation and Maintenance Manual for instructions and safety considerations. **Référez-vous au manuel des Opérations et Entretien pour instructions et mesures de sécurité.**



Caution, risk of danger!
Attention, danger potentiel!

For service by qualified service personnel only!
Entretien par le personnel qualifié seulement!

Replace with 120Vac, 15amp, time-delay fuse only.
Remplacer avec 120Vac, 15 amp, fusible à retardement seulement.



Earth Ground terminal
Borne de mise à la terre

SECTION 2, TECHNICAL INFORMATION

2.1 THEORY OF OPERATION

RO2:

The process of osmosis can be reversed by placing pressure upon the feed water side (concentrated solution side) of the membrane. Water will be forced through the membrane barrier to yield water that is purer on the lower pressure side of the membrane than on the more concentrated solution side (higher pressure side) of the membrane. The feed water will become more "concentrated," and will be discharged through the reject port known as "reject water" or "concentrate".

Hence, the liberation of purer water from its solutions is caused by the reversal of the osmotic pressure; the operation is termed "Reverse Osmosis". Reverse Osmosis is commonly referred to as "RO".

DI Polisher:

This system is designed to polish the RO2 product water in order to provide purified water used in laboratory applications. The facility's tap water first passes through the RO2, then enters the first deionizer column (worker) where the deionizer resin removes chemical contaminants from the water through an ion exchange process. The water then passes into the "polisher" column. As water leaves the polisher, the purified water passes through a 200,000-Ohm resistivity monitor with alarm and on to the storage tank.

Storage Tank:

The storage tank is equipped with high and low level float switches, which will turn the reverse osmosis unit off when the water reaches the predetermined cutoff point and turn the RO2 on when the tank is drained to the low level float. The distribution pump on the storage tank will cycle whenever the internal pressure of the pump drops below 29 PSI or there is flow greater than 0.3 GPM.

2.2 SPECIFICATIONS

Ideal, minimum, and maximum incoming water temperature	Min = 41° F (5° C) Max = 90° F (33° C) Ideal Temperature = 77° F (25° C)
Prefilter gauge pressure (when the RO2 is running) Minimum Maximum	 20 PSI 50 PSI (**P**ounds per **S**quare **I**nch)
Pump pressure – Minimum Maximum	 100 PSI 180 PSI
Maximum output of product water @ 77°F (25°C), TDS<1000 ppm of NaCl, & pump pressure of 150 psi.	RO2 - 2800 GPD (10598 LPD) (**G**allons **P**er **D**ay / **L**iters **P**er **D**ay)

Connections	RO Feed =3/4” Female GHT RO Product = 3/4" Male GHT RO Drain = 1/2" hose with check valve (**G**arden **H**ose **T**hread) Distribution Pump 3/4” FPT & MPT
Electrical Requirements	(2) X 115V/60Hz/20A dedicated GFI (**G**round **F**ault **I**nterrupter)
System Dimensions	66" L x 30" D x 62" H
Shipping Weight Operating Weight	507 lbs. 975 lbs.

2.3 SPECIFIC ENVIRONMENTAL/TRANSPORT CONDITIONS ANTICIPATED

ENVIRONMENTAL CONDITIONS ANTICIPATED

This device is intended to be used under the following conditions:

Indoor use;

Altitude up to 2000 m;

Temperature between 5°C and 40°C;

Maximum relative humidity 80% for temperatures up to 31°C decreasing linearly to 50% relative humidity at 40°C;

MAINS supply voltage fluctuations up to ± 10% of the nominal voltage;

Transient overvoltages present on MAINS supply = CATEGORY II;

Applicable RATED POLLUTION degree 2.

TRANSPORT CONDITIONS ANTICIPATED

Altitude up to 2000 m;

Temperature between 5°C and 40°C;

Maximum relative humidity 80% for temperatures up to 31°C decreasing linearly to 50% relative humidity at 40°C;

2.4 TEMPERATURE CORRECTED RO2 PRODUCTION RATES

RO2 membrane performance is affected by water temperature. The Product Water Flow Rate and Output decrease as the temperature of the Incoming Tap Water decreases. The chart below provides both Total Product Output (in **G**allons **P**er **D**ay) and Product Flow Rate (in **G**allons **P**er **M**inute).

- Measure your Incoming Tap Water temperature by reading the temperature on the controller LCD display.

- Follow the chart across to find your Temperature Corrected Product Water Total Output and Flow Rates.

RO2 Temperature Corrected Production Rates

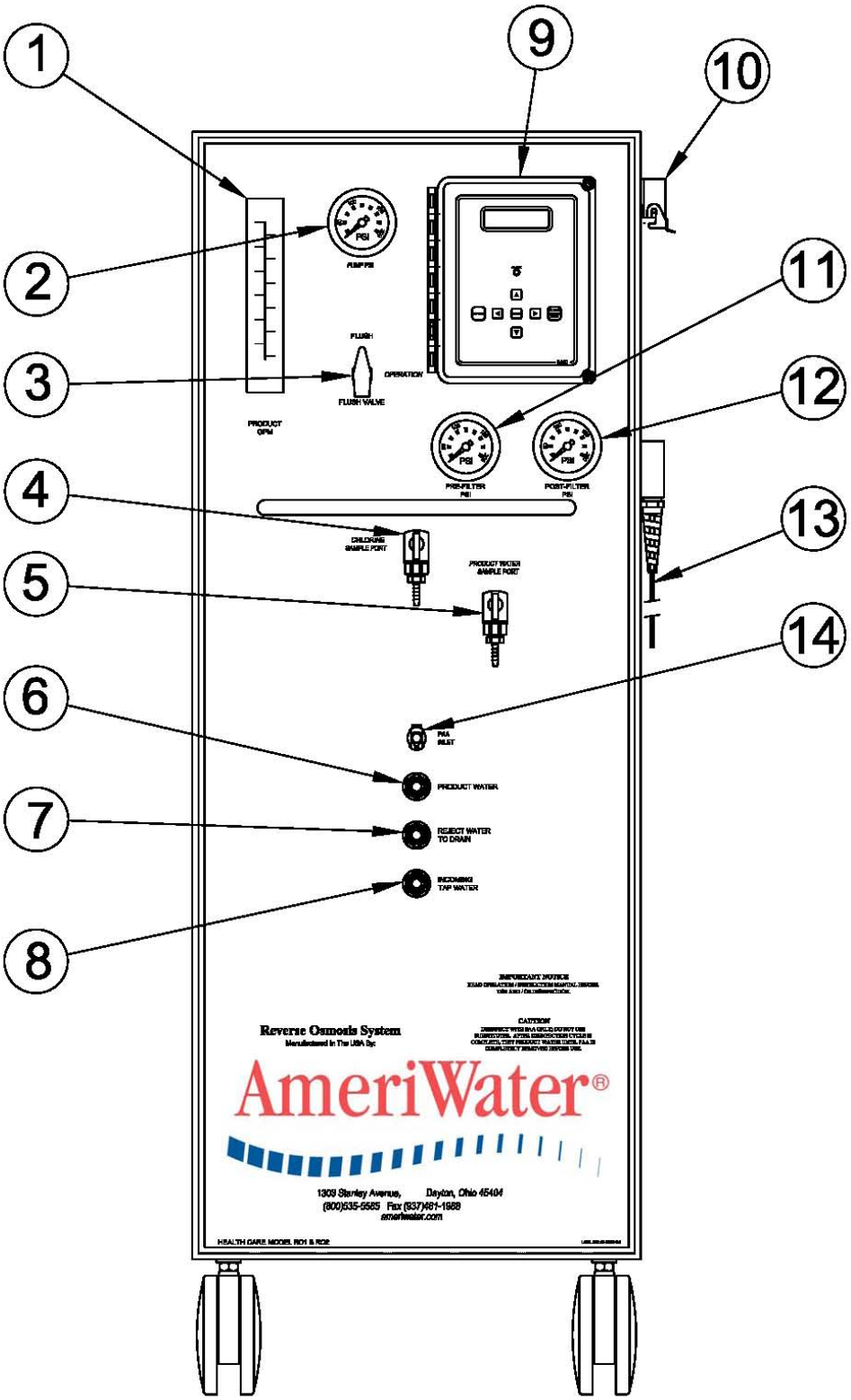
Temperature F	Temperature C	Total Output GPD	Flow Rate GPM
40	4.45	1428	0.99
45	7.23	1599	1.11
50	10.01	1764	1.22
55	12.79	1932	1.34
60	15.57	2100	1.45
65	18.35	2268	1.57
70	21.13	2486	1.72
75	23.91	2727	1.88

PT401 Antiscalant/Scale Inhibitor

Contaminants	Chemical Feed System
Membrane Scale Control	Not to exceed 40 ppm

SECTION 3, COMPONENTS AND SCHEMATICS

3.1 RO2 EXTERNAL FRONT VIEW



IDENTIFICATION OF COMPONENTS (EXTERNAL VIEW)

1. **PRODUCT GPM–** Flowmeter that measures the flow of the product water in gallons per minute (GPM) and liters per minute (LPM).

2. **PUMP PRESSURE –** Gauge that measures the primary feed pressure in pounds per square inch (PSI) from the pump through the RO2 membrane.

3. **TEMPORARY FLUSH VALVE –** When the unit is in operation, the valve must be in the "IN SERVICE" position. Move the valve to the "FLUSH" position to bypass the flow control and allow a faster flow of water to the drain during membrane flush.

4. **CHLORINE SAMPLE PORT –** Valve with nozzle to let small amounts of water out to test for the presence of chlorines before the RO2 membrane.

5. **PRODUCT WATER SAMPLE PORT –** Valve with nozzle to let small amounts of water out to test the quality of the product water.

6. **PRODUCT WATER –** Hose transmitting purified water from the RO2 system to the DI Polisher or Storage Tank.

7. **REJECT WATER TO DRAIN –** Hose transmitting wastewater to the drain.

8. **INCOMING TAP WATER –** Hose feeding tap water into the RO2 system.

9. **CONTROLLER –** Control mechanism for the RO2.

10. **SIDE ENTRY HOOD:** External wire installation for float level switches.

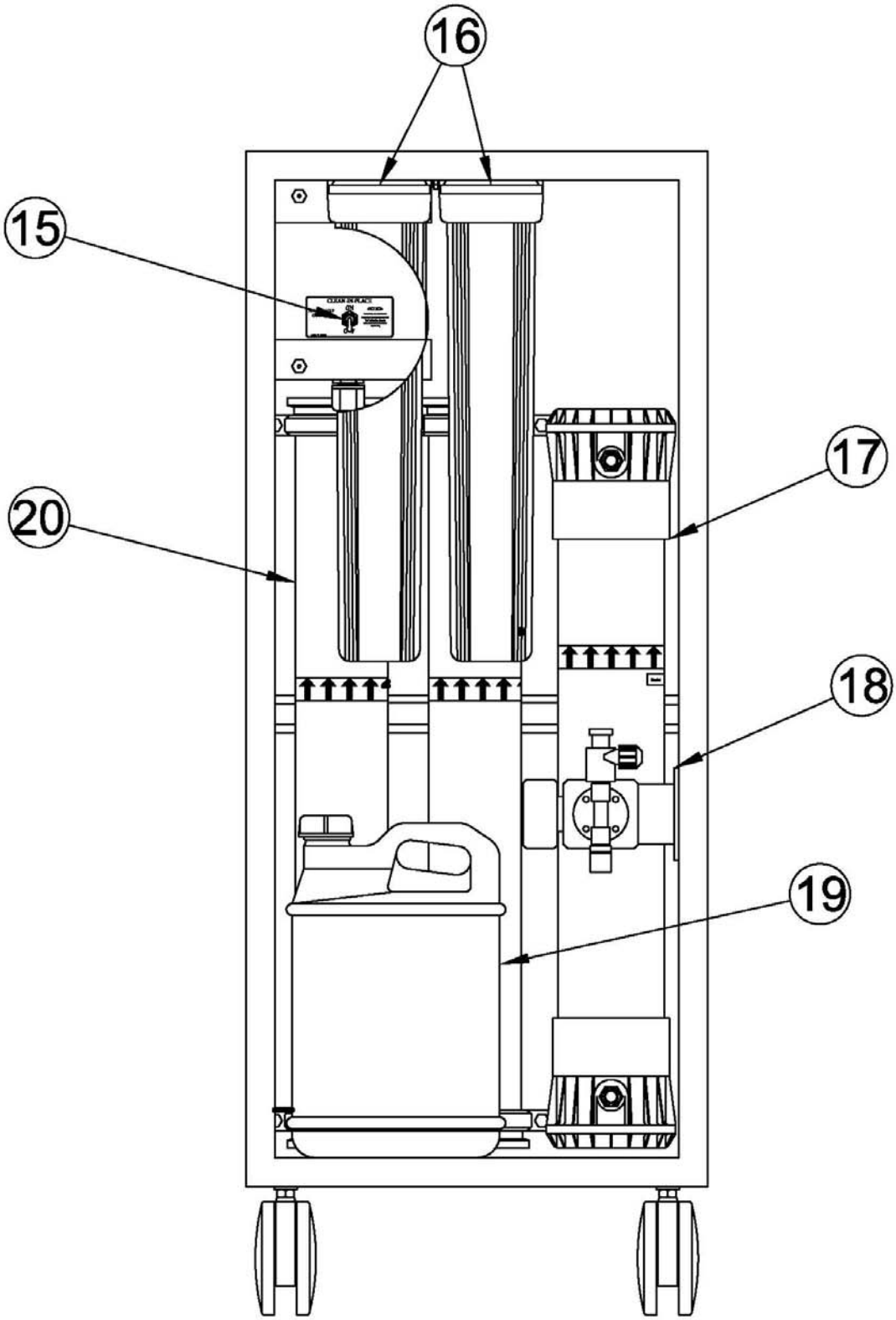
11. **PREFILTER INLET GAUGE –** Gauge that measures the pressure in pounds per square inch (PSI) of the incoming tap water as it enters the micron prefilter.

12. **POST FILTER OUTLET GAUGE –** Gauge that measures the pressure in pounds per square inch (PSI) of the water after going through the carbon cartridge filter. Change the micron prefilter when the outlet gauge reads 15 PSI less than the prefilter inlet gauge.

13. **HOSPITAL GRADE POWER CORD:** must be connected to a single phase, 3-conductor type, hospital grade receptacle with a ground fault interrupter (GFI) at 115V, 20amp, and 60Hz.

14. **PAA QUICK CONNECT FITTING (RO) –** Quick connect fitting that the PAA container is connected to on the RO2 for sanitization.

3.2 RO2 INTERNAL REAR VIEW



IDENTIFICATION OF COMPONENTS (INTERNAL VIEW)

15. **CLEAN IN PLACE (CIP) SWITCH** – When the CIP Switch is placed in the ON position, all RO2 fail-safe modes are disabled for low pressure membrane cleaning with the optional AmeriWater Clean In Place System (P/N 00CIP1).

16. **CARBON CARTRIDGE FILTERS –** Dual 10-micron carbon cartridges for removal of chlorine.

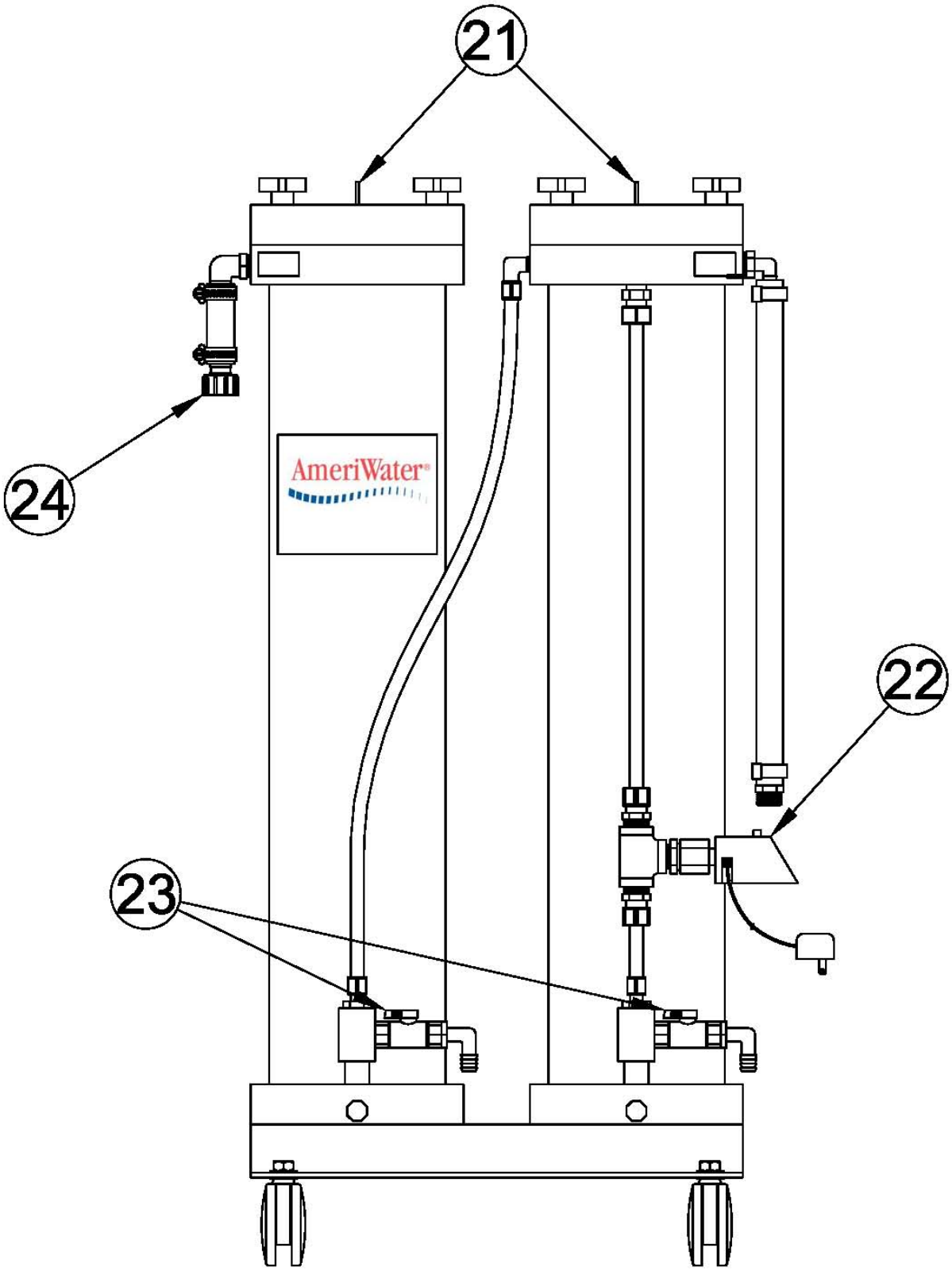
17. **PUMP** – Provides the pressure for the RO2 system. The RO2 ON/OFF switch controls the pump motor.

18. **PT401 FEED PUMP –** Injects PT401 Antiscalant / Scale inhibitor solution at a predetermined dosage based on a water analysis. The PT401 pump runs when the main pump runs.

19. **PT401 ANTISCALANT / SCALE INHIBITOR** – Plastic container filled with 2 ½ gallons of PT401 solution to prevent the RO2 membrane from scaling. The plastic container should be refilled with PT401 solution at least monthly or when on when it reaches the half-full level.

20. **MEMBRANES –** Spiral-wound, thin film, composite membranes for reverse osmosis.

3.3 DI POLISHER EXTERNAL FRONT VIEW



IDENTIFICATION OF DI POLISHER COMPONENTS

21. **AIR VENT SCREWS –** Vents provided to break the vacuum seal to facilitate resin changes.

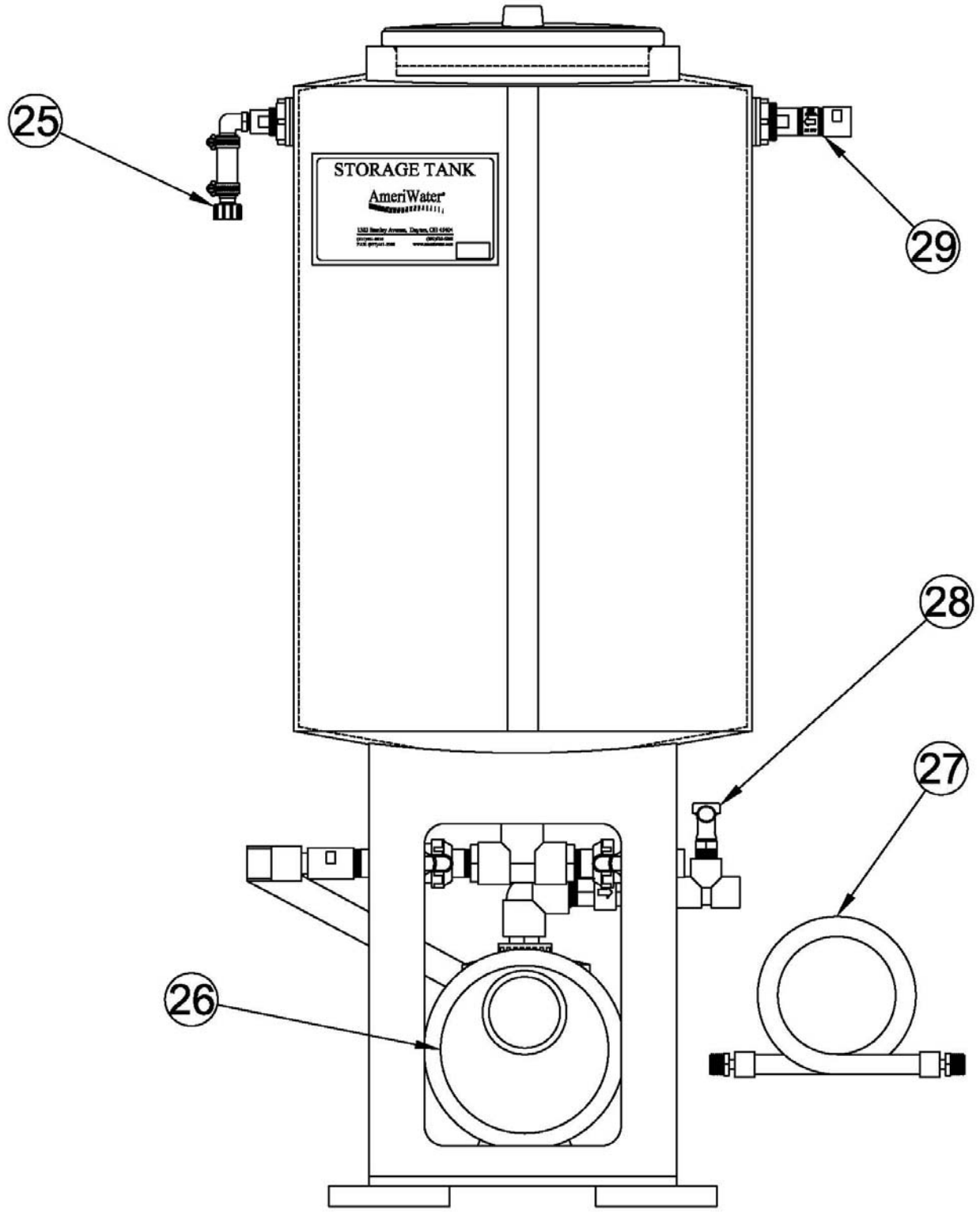
22. **200,000 OHMS QUALITY LIGHT –** Light with alarm that will indicate when the water is outside of the limit.

23. **DRAIN VALVES** – To allow for draining each column of the DI Polisher individually.

24. **WATER INLET** – Inlet for water from the RO2.

3.4 STORAGE TANK

EXTERNAL FRONT VIEW



IDENTIFICATION OF STORAGE TANK COMPONENTS (FRONT VIEW)

25. **WATER INLET** – Connection for the purified water into the tank.

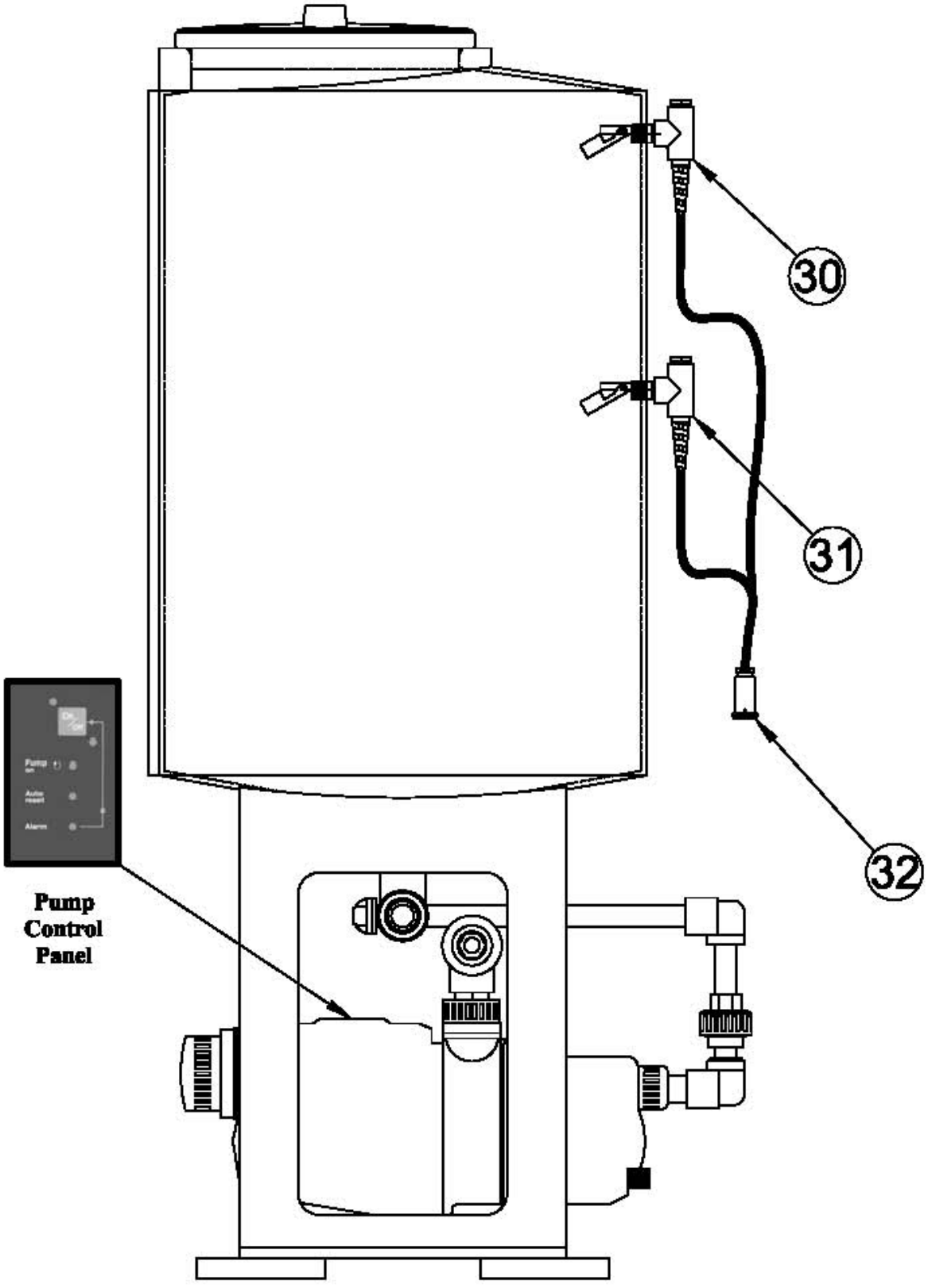
26. **DISTRIBUTION PUMP –** Pump that is used to distribute water to the system whenever the internal pressure drops to 29 PSI or there is greater than 0.3 GPM flow.

27. **SYSTEM OUTLET HOSE –** Hose that is provided to change the system outlet from ¾" FPT to ¾" MPT.

28. **BYPASS QUICK CONNECT –** Used to allow untreated water to completely bypass the system in the event of downtime.

29. **RETURN FROM LOOP –** Connection that can be utilized to allow the loop to re-circulate back into the storage tank to minimize opportunities for bacteria growth. The return flow control on this is 3 GPM.

STORAGE TANK EXTERNAL SIDE VIEW



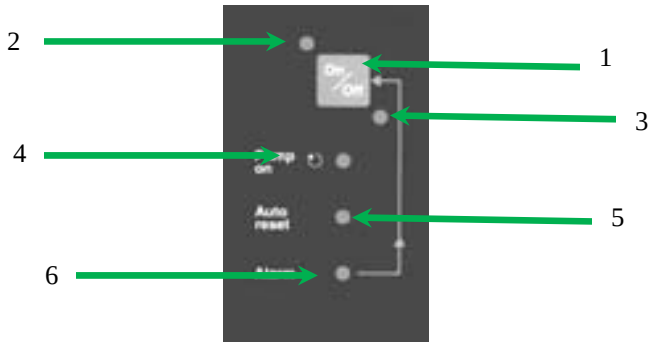
IDENTIFICATION OF STORAGE TANK COMPONENTS (SIDE VIEW)

30. **HIGH LEVEL FLOAT** – Sends a signal to the RO when the tank is full to stop water purification.

31. **LOW LEVEL FLOAT** – Sends a signal to the RO when the predetermined low level has been breached to have the RO begin water purification.

32. **SIDE ENTRY HOOD** – Provides connection between storage tank floats and the RO2.

PUMP CONTROL PANEL



1. **ON/OFF BUTTON** – Starts and stops the pump. The button can also be used to manually reset an alarm condition (press once to reset, press once more to start).

2. **POWER INDICATOR LIGHT** – Indicates that the pump is ready for operation (green). When the light is on, the pump will start automatically when water is consumed and stop a few seconds after the water consumption has ceased.

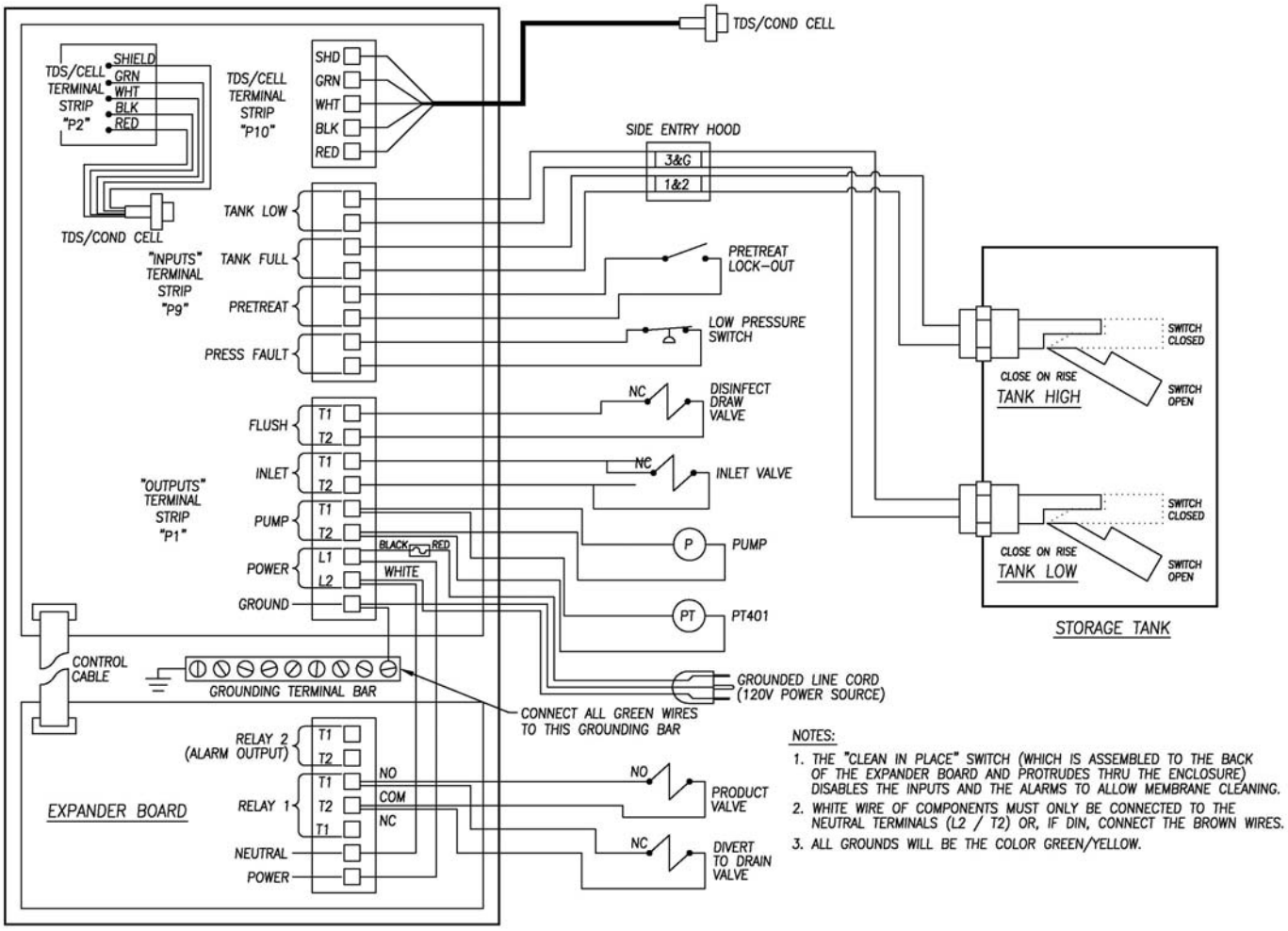
3. **POWER INDICATOR LIGHT** – Indicates that the pump is in standby (red).

4. **PUMP ON (GREEN)** – Indicates that the pump is running (green).

5. **AUTO RESET (GREEN)** – Indicates that the auto reset function is active. When on, the pump will automatically attempt to restart every 30 minutes after an alarm / fault over a period of 24 hours, after which the pump will remain in an alarm condition. When off, the pump will not restart after an alarm / fault. The auto-reset function can be activated or deactivated by pressing the ON/OFF button for 5 seconds.

6. **ALARM (RED)** – Indicates that the pump is in and alarm state. Manual resetting is possible by pressing the ON/OFF button.

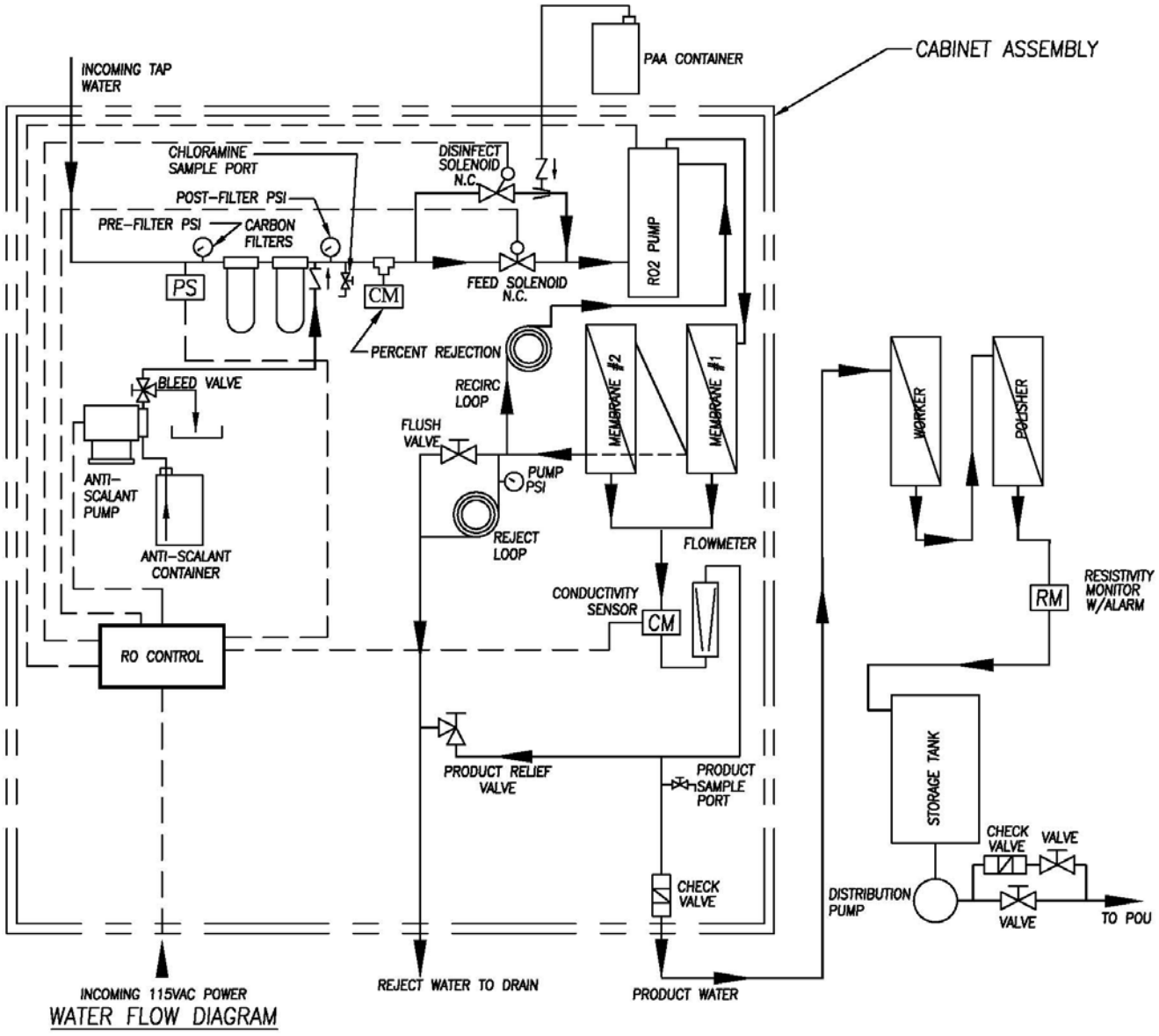
3.5 ELECTRICAL DIAGRAM



3.6 SIDE ENTRY HOOD

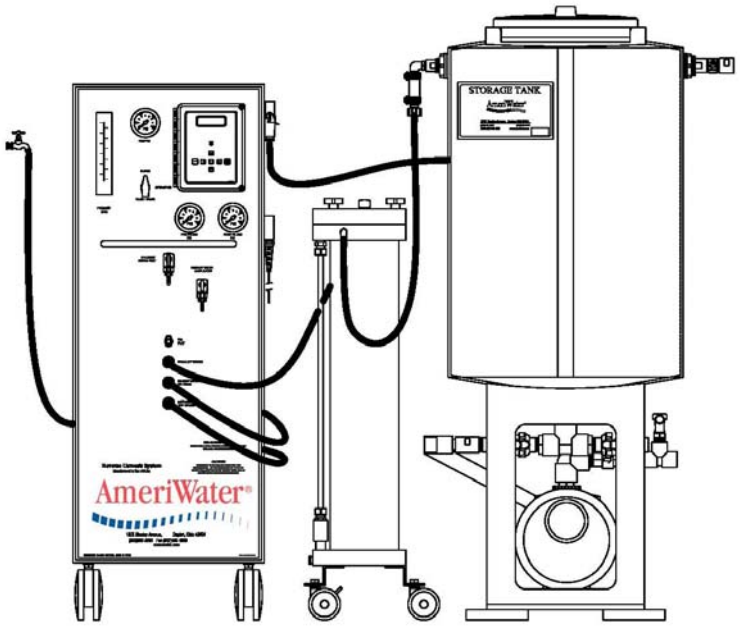
The external wire connection for High/Low Tank signals has a maximum voltage of 24 V and a maximum current of 500 mA. The connection allows signals from float switches in the storage tank to be sent to dry contacts within the ROS controller. The high tank float signals the RO to shut off in a tank-full condition, and the tank low float signals the RO to turn on when the water level in the storage tank is low. Installation of float wiring should be conducted by an AmeriWater service representative.

3.7 FLUID DIAGRAM



WATER FLOW DIAGRAM

SECTION 4, INSTALLATION



CAUTION: Local plumbing and electrical codes must be observed.

4.1 GENERAL INSTALLATION INSTRUCTIONS

1. The high purity water system can be installed with up to 50’ of pipe from the point of use.

   a. Subtract 2’ from the 50’ length for each elbow in the pipe.

   b. Pipe size and the number of worker/disinfector/sterilizers will also affect the distance.

2. If there is a need for more pressure or flow rate, the high flow storage tank should be considered.

4.2 RO2 INSTALLATION

1. The electrical source must be single phase, 3-conductor type provided with a hospital grade receptacle and a ground fault interrupter (GFI) at 115V, 20amp, and 60Hz. The proper polarity and ground integrity must be initially checked and thereafter maintained. Failure to do so may result in electrical shock to the operator. It is suggested that the RO2 be placed on an electrical supply with emergency backup.

2. The RO2 must only be plugged directly into a GFI receptacle. It must not be plugged into an extension cord or power strip that could cause low amperage.

To avoid electrical shock, always unplug the RO2 system before opening the face of the electrical controller.

3. Incoming water should be between 41° F and 90° F (5° C and 33° C). It is not recommended to use water at temperatures below 41° F (5° C) as it will reduce membrane performance significantly. Use only the cold water supply unless using an automatic blending valve to get 77° F (25° C) water. Never use water warmer than 90° F (33° C).

4. Water with silt density index (SDI) above 5 SDI will foul the membrane.

5. The RO2 system is equipped with a pretreatment system to remove chlorine. It is important to test for chlorine at the CHLORINE SAMPLE PORT periodically. Chlorine will deteriorate the membrane and cause system failure. It is recommended to use a Chlorine test strip.

6. Incoming tap water pH should be within EPA National Secondary Drinking Water Regulations of 6.5 - 8.5. Incoming tap water with pH higher or lower than the regulation will cause higher conductivity in the product water. If the water changes drastically, the membrane will be harder to clean. Periodically check the pH of the incoming tap water to verify that it is within the specified range (IBT pH Water Test Strips P/N 97PH20901).

7. Always maintain water flow and pressure to avoid damage to the pump.

8. Minimum feed pressure is 20 PSI @ 5 GPM (while the RO2 is in operation, with flow). Maximum feed pressure is 50 PSI.

9. Lock the two front casters so that the RO2 will remain stationary during startup.

10. Remove the plugs from the PRODUCT WATER, REJECT WATER TO DRAIN, and INCOMING TAP WATER fittings on the front of the RO2.

11. Connect the INCOMING TAP WATER, PRODUCT WATER and REJECT WATER TO DRAIN hoses to the appropriate fittings on the RO2. All hoses should run to the right side of the RO2. This will allow you to move the RO2 forward to access the rear panel.

CAUTION: To insure proper assembly, tubing extension MUST be fully inserted into the fitting body to the tube stop.

12. Open the back cover and remove the gray packing foam between the PT401 CONTAINER and the cabinet wall.

13. Plug the power cord into a dedicated 115-volt, 20-amp GFI receptacle.

4.3 DI POLISHER

1. Locate the DI Polisher to the right of the RO2, just before the storage tank.

4.4 STORAGE TANK

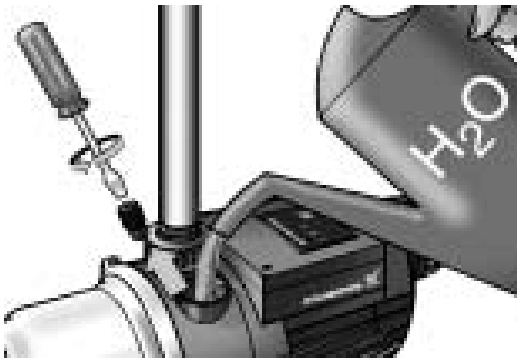
1. Locate the storage tank on a firm, level foundation. For seismic requirements, drill (4) 5/8" diameter holes into the concrete through the mounting holes in the storage tank feet a minimum of 4" deep. Install (4) 5/8" diameter, HILTI KB-TZ Expansion anchors through the 4 holes on the pads to anchor into the ground. A minimum of 4 threads for each anchor must be below the concrete prior to application of 60 ft-lbs of torque.

2. Connect the DI Polisher outlet hose to the storage tank's inlet.

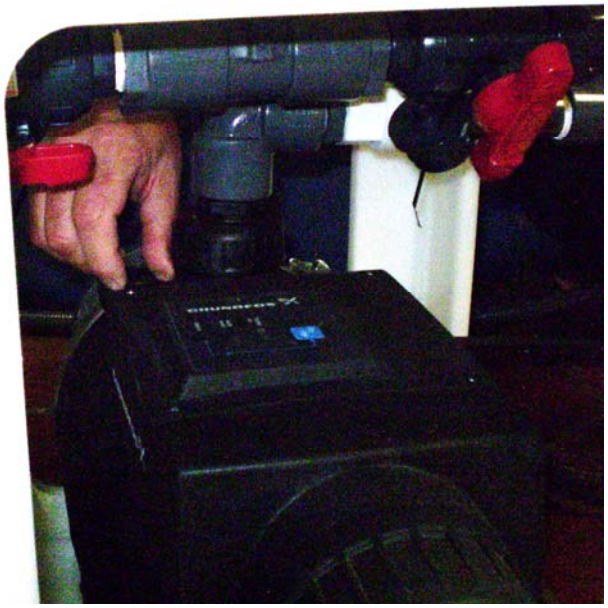
3. Connect the discharge from the pump to the distribution piping.

4. Run the float – switch quick disconnect to the RO2 and lock in place.

5. Prime the pump by loosening the priming plug on the top of the pump and opening the valve from the tank to allow 1.2 – 1.5 gallons of water to fill the pump. Replace the priming plug.



6. Plug the pump directly into a dedicated 115-volt, 20-amp GFI receptacle.



SECTION 5, SYSTEM START-UP

1. Connect the RO2 INCOMING TAP WATER hose to the potable cold water supply using the Incoming Tap Water hose and fittings supplied. If blending both warm and cold water to improve product flow rate, do not exceed 90° F (33° C).

2. The REJECT WATER TO DRAIN hose coming out of the RO2 system is for reject water. The water from this hose will go down the sink or drain. Leave at least a 2" air gap between the hose and the drain to prevent contamination or siphoning.

3. The PRODUCT WATER hose should also be secured to the sink or drain.

4. Relieve the pressure from the system by opening the CHLORINE sample port.

5. Open the back cover, remove the filter bowls and turn the CIP SWITCH to off.

6. Verify that the carbon cartridges are installed and re-install the filter bowls.

7. Close the CHLORINE sample port and turn on the potable cold water supply to the RO2.

8. Turn on the RO2 and place the FLUSH VALVE in the FLUSH position. Allow RO2 to run in FLUSH for 30 minutes.

NOTE: The RO2 conductivity alarm may sound, which is normal when it is in FLUSH. Press the ALARM SILENCE key on the RO controller to silence the alarm. The alarm will restart after a 3 minute delay.

9. After flushing for 30 minutes, turn the FLUSH VALVE to OPERATION position.

10. Run the product water to drain for at least 10 minutes.

11. Verify that the PRODUCT GPM FLOWMETER indicates at least 0.90 GPM.

12. Refer to the Operation Log in Section 7.0 MONITORING. Complete the log; making sure that the system is operating within all the required ranges.

WARNING: Do not use the RO until all specifications are met.

13. When the log shows that all start-up conditions are met, the system is now ready for use. Press the POWER key (the display will show STANDBY). Connect the PRODUCT WATER hose to the DI Polisher inlet.

14. Install the resin packs in the DI Polisher

a) Lock the front wheels. Remove the cover plates by unscrewing the four black knobs on each plate. To break the seal between the cover plates and the upper plates, use a slotted screw driver in the pry notch located in the top of each upper plate. Open the drain valve at the bottom of each column.

b) Remove the resin pack from the shipping box and open the tied end of the plastic sleeve. DO NOT remove the resin pack from the plastic sleeve at this time.

c) Stretch the resin pack over your arm to elongate the pack, and feed it into the column allowing the pack to slide out of the plastic sleeve. Save the plastic bag for future exchange.

d) Verify that the O-ring is clean and in place and replace the cover plates. Tighten the black knobs evenly by turning the knobs at opposite corners at the same time. Repeat for the other two corners.

CAUTION: Failure to tighten the knobs completely may cause the cover plate to separate from the system when pressurized.

e) Close the drain valve at the bottom of the column.

f) Repeat steps a. through e. for each of the columns.

15. Open the air vents located on the top of the cover plates and turn on the water supply and the RO2. Tighten the air vents closed when water begins to escape through the vents.

16. Ensure that the DI Polisher quality light is plugged into a GFI receptacle.

17. When the resin is changed, the light may indicate red initially, but should switch to green, indicating good quality.

18. Lock the casters on the DI Polisher.

19. Verify that the distribution pump is plugged into a dedicated 115-volt, 20-amp GFI receptacle.

5.1 PT401 PRIMING PROCEDURE

AmeriWater RO products featuring the PT401 antiscalant system are equipped with a priming valve. The following procedure should be followed during the initial start up of the RO2 system, and whenever the PT401 pump loses its prime:

1. Verify that the RO is on and running.

2. Be sure the injection pump's suction line is immersed in solution in the PT401 container.

3. Press the ON key to turn on the PT401 injection pump.

4. Press the "UP" key to increase the STROKE RATE up to approximately 150 to 200, or the "DOWN" key if already greater than 200.

5. Remove the lid form the container and verify that there is discharge of PT401.

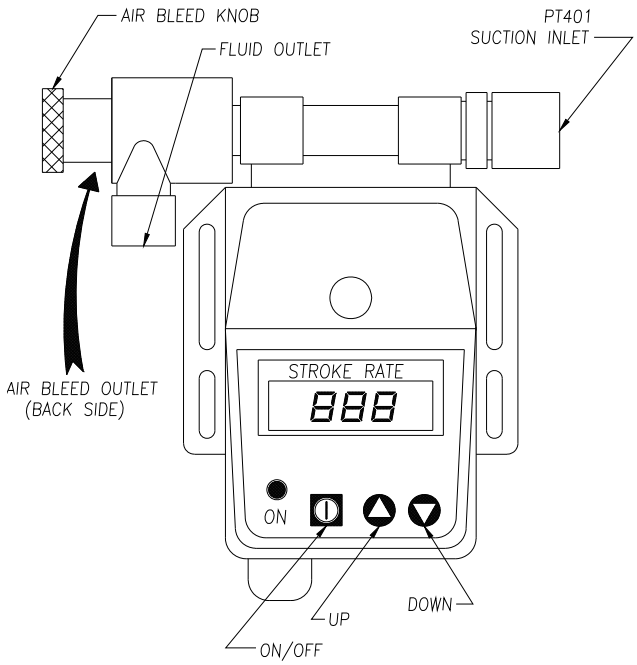
6. Close the adjustment knob completely by turning clockwise until the knob stops, making sure there is no liquid flow out of the air bleed tubing.

If the pump does not prime, repeat the foregoing steps.

Once the pump has been primed, and is pumping the chemical through the head into the water stream, adjust the stroke rate to "5".

At the stroke rate of 5, the PT401 injection pump will put about 150 milliliters (approximately 5 liquid ounces) per hour into the RO2 incoming water stream.

Repeat these steps as necessary when the system is started after sitting for extended periods of time or the PT401 Bottle is empty and air has drawn into the pump. The priming may not take as long as the initial time.



WARNING: Overdosing PT401 will adversely affect (blind) the membrane causing a decrease and/or loss of permeate flow.

WARNING: If softened water is supplied, turn off the PT401 system by depressing the on/off button on the chemical feed pump and emptying the PT401 jug.

5.2 REFILLING PT401

The amount of PT401 in the container should be checked weekly. When it is less than half full, you should add more PT401.

Remove the cap from the PT401 Container. It is not necessary to remove the rubber stopper with the hose; this will break the prime of the PT401 pump. Refill the bottle with new PT401 purchased from AmeriWater (P/N 95810125, sold in (4) 1 gallon containers). Close the bottle with the cap. If the PT401 Container is run dry, follow the priming procedures above.

5.3 PT401 ANTISCALANT SETTINGS

The digital readout on the PT401 injection pump can be adjusted from 0 to 360 strokes per minute. Based on the hardness of the feed water, the following stroke settings are recommended:

HARDNESS (Grains Per Gallon)	STROKE SETTINGS
1-6 GPG	4
7-20 GPG	5
21-40 GPG	6

For water with hardness greater than 40 GPG, contact AmeriWater for consultation 1-800-535-5585

SECTION 6, OPERATION

6.1 OPERATION

Once the system has been started, the RO2 will continue to make water until the high-level float switch is tripped on the storage tank. At this point, the RO2 will be placed into standby (tank full) until the low-level float switch is tripped.

Once the low level float is tripped, the RO2 will re-initialize and begin to produce water again.

In the event that the conductivity is above the pre-determined set-point, an alarm will sound.

The storage tank will still operate as normal.

6.2 BYPASS PROCEDURE

1. Turn off the POWER to the RO2 and Distribution Pump.

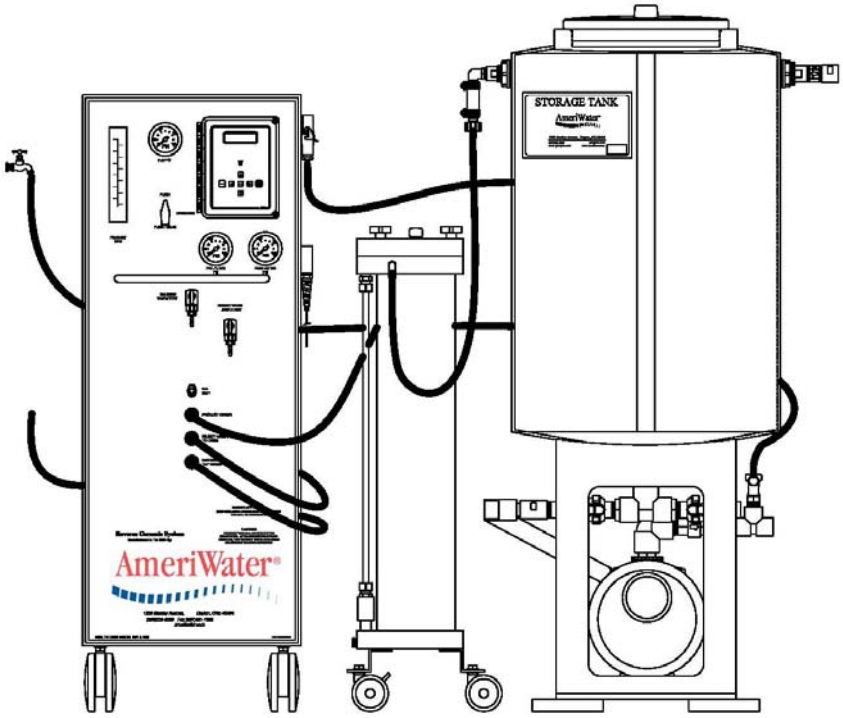
2. Shut off the water supply to the system.

3. Remove the RO2 water inlet hose from the source.

4. Retrieve the bypass hose and install to the incoming water supply.

5. Connect the CPC connector into the fitting just after the pump on the storage tank.

6. Turn on the water to begin bypass operation.



SECTION 7, MONITORING

Fill out the monitoring log prior to each use. Having this information available will help to quickly diagnose issues related to performance. Failure to carry out the daily monitoring and maintenance at the indicated intervals will result in reduced performance of the RO2 system and may void the warranty.

1) DATE								
RO PERFORMANCE (DURING WATER FLOW)								
2) Temperature **(41ºF - 90ºF)**								
3) Product flow **(0.90 GPM)**								
4) Pump PSI **(100 - 180 PSI)**								
5) Filter Pressure Drop **(maximum 15 PSI)**								
6) Hour Meter Reading								
7) Chlorine Test **(maximum 0.1 PPM)**								
8) Product Water Quality Reading								
9) Verify light on DI Polisher is Green								
10) Verify that the distribution pump is not in alarm								
EXCHANGE								
11) Carbon Block Filter Cartridges								
12) Clean or Replace the Membrane								
13) Add PT401 Antiscalant								
14) DI Polisher Resin Change								
INITIALS								

SECTION 8, MAINTENANCE

WARNING: **If any component of the water treatment system is changed or replaced, the user should conduct appropriate tests to ensure that the revised system meets all standards to which it was initially tested.**

1. AmeriWater has provided an Operation Log for the RO2 system. The recorded information may be useful in troubleshooting problems encountered with the system.

2. The DI resin, membrane and carbon cartridges are non-durable components and will need to be exchanged periodically.

8.1 RO2 NORMAL MAINTENANCE ITEMS

Preparation

1. Turn off the RO and remove from the power source.

2. Turn off the incoming tap water supply.

3. Place a container under the CHLORINE TEST PORT. Slowly open the sample port to relieve the pressure and let the water drain.

4. Remove the rear cover.

To Exchange the Carbon Block Filters:

1. Use the filter wrench to unscrew the filter housing and discard the used filter(s).

2. Partially unwrap the plastic from a brand new filter. Holding the end covered with plastic, place the new filter in the housing. Discard the plastic after installation.

3. Screw the filter housing back on making sure the o-ring is in the groove and not pinched. Hand-tighten, only.

To Exchange the Membrane:

1. Disconnect the fittings that secure the tubing to the sides of the membrane.

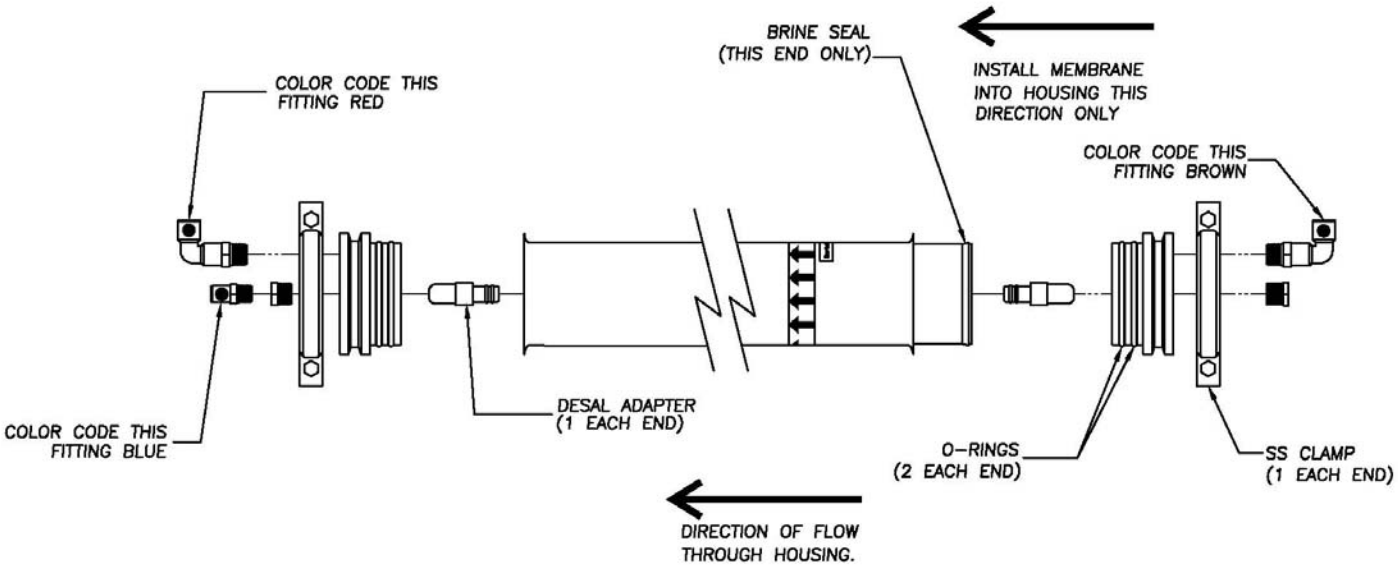
2. Remove the Unistrut clamp holding the membrane assembly.

3. Lift out the membrane assembly.

4. Loosen the nuts on the retaining clamp on the feed side to remove the cap and slide old membrane out of the housing and discard.

5. Install the new membrane in the housing with the brine seal at the Inlet end of the housing, and replace the cap and retaining clamp.

6. Connect the feed (brown) fittings at the bottom of the new membrane housing in the same way the system was initially connected. Secure the new membrane assembly into place, and connect the remaining fittings at top of membrane housing (Reject = red, Product = blue, Inlet = Brown).



Rinse Out Cycle

After the exchange is complete, it is important to put the RO through a rinsing out cycle to flush the preservative out of the new membrane.

1. Put the PRODUCT WATER hose at a sink or drain.

2. Turn the FLUSH VALVE to the FLUSH position. The Pump pressure will be lower than normal during this rinse out cycle.

3. Turn on the RO and allow water to run through the system for a **minimum of 30 minutes** until the water is clear. This will rinse the preservative out of the new membrane.

CAUTION: The membrane is not rinsed thoroughly until the water is clear!

4. Turn the FLUSH VALVE to the OPERATION position and allow the RO to run until the conductivity is below the setpoint and no longer alarming. Turn off the RO.

5. Reconnect the PRODUCT WATER hose to the DI Polisher.

6. Turn on the RO. The rinse out cycle is now complete, and the RO is ready for use.

To Replenish PT401:

1. Remove the back cover, then, simply unscrew the cap on the bottle, and add the PT401. After refill, the PT401 pump may need to be primed again.

8.2 DI POLISHER RESIN PACK EXCHANGE

1. Turn off the water supply to the RO2 system.

2. Open the air vents located in the center of the cover plates.

3. Place a container under the Drain Valves located on the bottom plates of the system.

4. Open the valves and allow the water to drain into the container. The container may be emptied at a drain.

5. Remove the cover plates by unscrewing the black knobs located at each corner of the cover plates.

6. Pull the exhausted resin pack part of the way out of the column and lay it over the top of the system.

NOTE: If the Drain Valve located on the bottom plate is not open, a vacuum will be created making it difficult to remove the resin pack.

7. Slowly pull the exhausted pack over the side of the column while sliding it out of the column and into the plastic sleeve that it was shipped in.

8. Remove the new resin pack from the shipping box and open the tied end of the plastic sleeve.

9. Stretch the resin pack over your arm to elongate the pack.

10. Feed the pack into the column allowing it to slide out of the plastic sleeve. Save the plastic sleeve for the return shipment of the resin pack at the next exchange.

11. Carefully wipe the O-rings and the grooves on the top plate and cover plate to remove any debris from the surfaces that must seal together.

12. Replace the cover plates and tighten the knobs. To ensure proper tightening and a good seal, hand-tighten the knobs in opposite corners simultaneously. Repeat for the other two corners.

13. Turn on the water supply to the RO2 and remove trapped air by loosening the air vents located in the center of the cover plates.

14. Tighten the air vents when water begins to escape through the vent. This ensures that all of the air has been removed from the system and maximizes the life and efficiency of the resin packs.

8.3 DI POLISHER RESIN PACK REGENERATION

Regeneration certificates are used to simplify the exchange of your exhausted DI Polisher system packs. The certificate has been purchased and will be used as payment for the resin pack regeneration service. Simply follow these steps:

Fill out a regeneration certificate by printing your name, phone number, company and address.
When you send each pack to AmeriWater, enclose the regeneration certificate in the box. AmeriWater will ship you a freshly regenerated resin pack.
To order more certificates, contact the company that originally sold you the deionizer. Be sure to keep regeneration certificates on hand to ensure uninterrupted service.
It is recommended to send the exhausted resin to AmeriWater immediately after exchange. This will allow time for shipment and will maintain your uninterrupted supply of deionized water.

Certificates Make Exchanging Packs a Breeze!

AmeriWater
Resin Regeneration Certificate
This certificate has been purchased and will be used as payment for the resin pack regeneration service.
When you send each pack to AmeriWater, enclose this regeneration certificate in the box. AmeriWater will ship you a freshly regenerated resin pack. To order more certificates, contact the company that originally sold you the deionizer.
Fill out for return shipment to:
Name
Phone ( )
Company
Address
Address
City
State/Zip
www.ameriwater.com
2101C Standard Resin Pack
Ship exhausted pack and certificate to:
AmeriWater Inc.
1257 Stanley Ave.
Dayton, Ohio 45404

Fill out and enclose in box for return shipment

- NO Paperwork
- NO Phone Calls
- NO Purchase Orders

SECTION 9, ALARMS

9.1 RO2 OPERATING STATUS MESSAGES & ALARMS

The operating status of the unit is shown on the top line of the display. The following list describes the items shown for the operating status and alarms.

STANDBY - The unit is in the STANDBY mode.

DELAY 99 - The unit is in the RO2 start delay. The number is the seconds remaining before the pump starts.

OPERATING - The RO unit is operating.

TANK FULL - The unit is shut down due to a tank full condition.

PERCENT REJECTION – Shows the % of TDS rejected by the RO2.

TEMPERATURE – Indicated the temperature of the incoming water.

CONDUCTIVITY – Measurement of the quality of the water.

PRESS FAULT - If the pressure fault input becomes active (closes) and stays active for the delay programmed in the PF Delay Setpoint, the unit will shut down for a pressure fault. The display will show PRESS FAULT, the alarm lamp will flash and the audible alarm will sound. The pressure fault can be cleared by pressing the Alarm Silence/Reset key twice.

MEMB FLUSH 99 – Membrane Flush is active. The number is the minutes remaining in the flush cycle. This setting is not normally used.

HI COND - If the Conductivity reading exceeds the limit programmed the Cond Limit Setpoint for the delay programmed in the Cond Delay Setpoint, the alarm lamp will light and the HI COND warning message will show on the display. This warning will clear when the Conductivity drops below the Setpoint.

When the High Conductivity warning message is active, the RO2 model will divert the Product water to drain (through the Reject hose), until the Product water goes back into the acceptable range.

9.2 DI POLISHER ALARMS

WATER QUALITY INDICATOR LIGHT – Will illuminate green when the water is within the required parameters. When the light changes to red and there is an audible alarm during normal product flow, this indicates that the resin packs will need to be exchanged. The audible alarm can be silenced by depressing the detent on the face of the alarm.

SECTION 10, STANDARD SETPOINT TABLE

VIEWING THE SETPOINTS;

Press the LEFT ARROW key to view the set points.

Press the ALARM SILENCE/RESET key to cancel the operation.

SET POINT	FACTORY SETTING
TDS / CONDUCTIVITY LIMIT	50
TDS / CONDUCTIVITY DELAY	10
RO START DELAY	10
PRESS FAULT DELAY	10
AUTO RESET (PSI)	0
ALARM SILENCE	3
TF RESTART DELAY	5
TF RESTART	0
TFO TIME	3
TANK LOW RESTART	0
FLUSH TYPE	0
FLUSH TIME	0
FLUSH INTERVAL	0
FLUSH MODE	0
MAXIMUM HOURS	0
CURRENT HOURS	0
EXPANDER MODE	0
TEMPERATURE OFFSET	0
TEMPERATURE UOM	0
SWITCH SELECT	0
TDS / CONDUCTIVITY UOM	0
TDS / CONDUCTIVITY RANGE	1
C2 RANGE	4
C2 LIMIT	0
% REJECTION	1

SECTION 11, OPTIONAL DISINFECTION

AmeriWater recommends that all HCRO systems should be disinfected at least annually. The following sections will outline the disinfection steps for the RO, optional Silex deionizer and Storage Tank.

11.1 RO DISINFECTION

1. Switch off the RO by pressing the POWER key (the display will show STANDBY).

2. Disconnect the RO PRODUCT WATER hose from the next point of use.

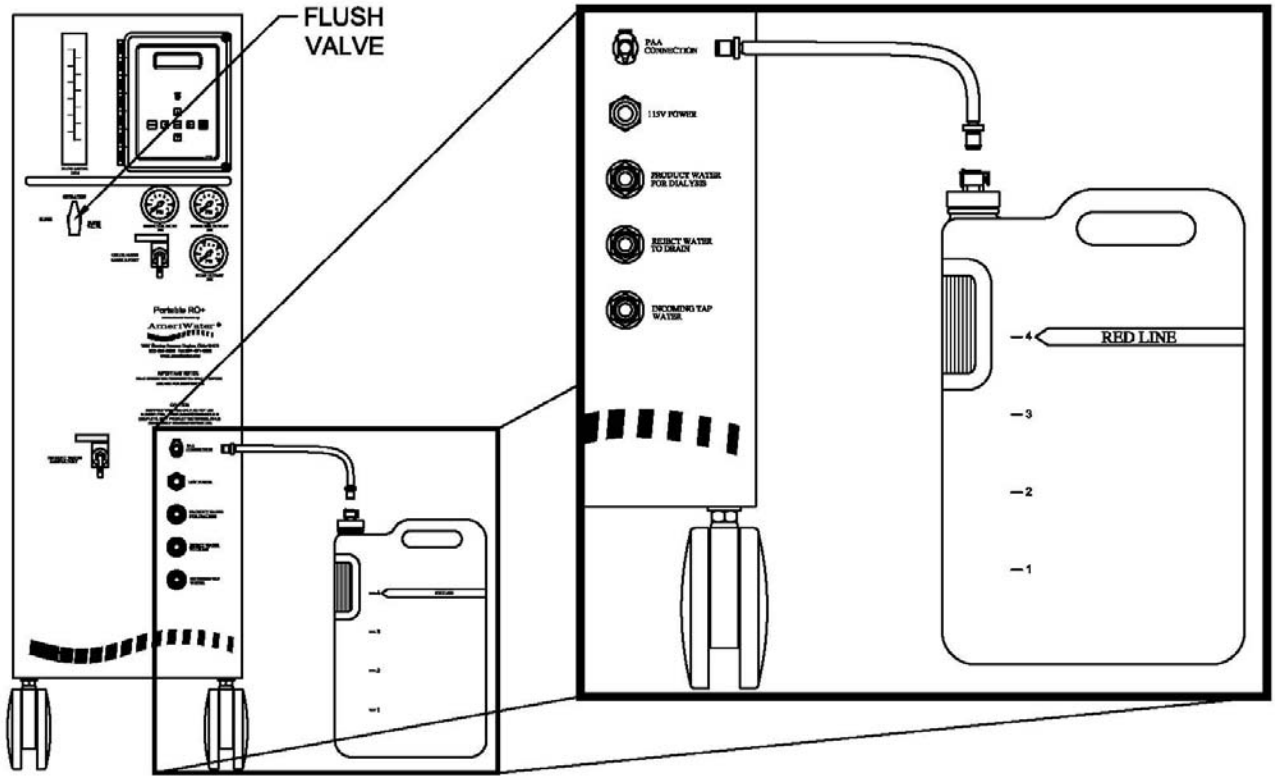
3. Place the PRODUCT WATER hose with the REJECT WATER TO DRAIN hose at a sink. Secure PRODUCT WATER hose in place so that the entire length of the hose will "flood" during disinfection.

4. Put on rubber gloves, apron, and goggles.

5. Unscrew the cap assembly of the PAA container.

6. Add 150 ml of 100% hydrogen peroxide/peroxyacetic acid disinfecting solution to the PAA Container and fill with water to the red line. (You may use tap water or treated water). Screw the cap assembly back on the PAA container.

CAUTION: Exposure to hydrogen peroxide/peroxyacetic acid (PAA) concentrate or solution may cause severe chemical burns to skin or eyes. Additional information regarding PAA is found in this section, on your PAA bottle, and the Material Safety Data Sheet. Please read carefully before using.



7. Lightly shake or tilt the container to mix the solution.

8. Connect the PAA tubing to the PAA connection on the front of the RO.

9. Turn the FLUSH VALVE to the FLUSH position.

10. Turn on the feed water supply to the RO.

11. Press and hold the LEFT ARROW key, and then, press the RIGHT ARROW key. This will access the DISINFECT MODE. The controller display will show DISINFECT ENABLED, and then the keys can be released.

12. Press and hold the ENTER key. Pressing and holding the ENTER key will turn on the Disinfect Draw function and THE DISPLAY WILL READ **DISINFECT ENABLED DRAW**. Continue to hold the ENTER key, until all of the PAA is drawn in.

13. If the PAA tubing begins to suck air, immediately release the ENTER key. Place the FLUSH VALVE in the OPERATE position. Avoid extra time running because PAA will be diluted.

CAUTION: Avoid sucking air when the container is near empty.

NOTE: The ENTER key must be held until the PAA is drawn container is nearly drawn empty into the RO.

A. AVOID STOPPING AND STARTING THE DISINFECT FUNCTION WHICH MAY CAUSE A THERMAL OVERLOAD OF THE RO PUMP. IF A THERMAL OVERLOAD OCCURS, IT WILL AUTOMATICALLY RESET FROM 1 TO 5 MINUTES – WAIT UNTIL THE PUMP OVERLOAD RESETS TO RESUME THE PAA DRAW.

B. RELEASING THE ENTER KEY MAY CAUSE THE SYSTEM TO LOSE ITS PRIME PREVENTING ALL OF THE DISINFECTANT FROM BEING DRAWN INTO THE MRO.

C. APPROXIMATELY ¼" OF THE SOLUTION WILL REMAIN IN THE BOTTOM OF THE PLASTIC CONTAINER. THIS IS NORMAL AND MAY BE EMPTIED DOWN THE DRAIN AFTER THE ENTIRE PROCESS IS COMPLETE.

14. At this point, the RO is filled with the hydrogen peroxide/peroxyacetic acid disinfecting solution. To ensure that this solution has passed through the system, use a PAA test strip (Peracid Test Strips, P/N 97HP20401) at the REJECT WATER TO DRAIN hose; the results should be at least 1% (500 ppm). Use another PAA test strip (Peracid Test Strips, P/N 97HP20401) at the PRODUCT WATER hose; the result here should be at least 0.5% (250 ppm).

NOTE: You may need to press the ENTER key to sample the flow being discharged from the REJECT WATER TO DRAIN and PRODUCT WATER hoses. If the test strip does not show PAA disinfecting solution at the specified levels in the Reject Water and Product Water, press the ENTER key again to continue flow; repeat the PAA test until both test positive (at the specified levels). If the test strip still does not show the disinfecting solution at the required levels, repeat disinfect draw procedure until the tests show positive at the required levels.

15. Allow the PAA mixture to soak in the RO for at least 60 minutes.

WARNING: Soaking longer than five hours may cause damage to the membrane.

16. After the soaking time has elapsed, turn on the RO by pressing the ALARM/SILENCE RESET to restart the RO in the operating mode. Allow the machine to run at its current setting for at least 15 minutes.

17. After rinsing the RO in the normal operating mode for 15 minutes (minimum) turn the FLUSH VALVE to the FLUSH position, and allow the RO to run for another 15 minutes.

18. After the time has elapsed running in the FLUSH position, return the FLUSH VALVE to the OPERATION position, and continue rinsing for 15 minutes or until the water from the PRODUCT WATER hose, REJECT WATER TO DRAIN hose and the product sample port test negative for PAA.

WARNING: Continue rinsing and testing until both test strips show a negative result (no color change) to ensure that there is less than 3 PPM of PAA in the system. AmeriWater recommends using Renal Check PX Test Strips (P/N 97PX20501).

19. Disinfection is now complete. Press the POWER key to turn off the RO. The display will show STANDBY.

11.2 A WORD ABOUT HYDROGEN PEROXIDE/PEROXYACETIC ACID

Do not use hydrogen peroxide/peroxyacetic acid concentrate (PAA) after the expiration date. Using outdated PAA concentrate may cause incomplete disinfection.

PAA loses effectiveness if not kept out of direct sunlight and/or the cap is not tightly sealed. Using ineffective disinfecting solution will cause incomplete disinfection.

Using less than the required volume of PAA will result with incomplete disinfection.

Disposal of Outdated Hydrogen Peroxide/Peroxyacetic Acid:

Supplies Needed
- a sink with a supply of tap water
- rubber gloves, lab apron, and goggles
- a supply of paper towels

1. Put on rubber gloves, apron and goggles.

CAUTION: Exposure to PAA concentrate or solution can cause severe chemical burns to skin or eyes.

2. Start a flow of cold tap water to dilute the PAA as it flows down the sink drain.

3. Slowly and carefully pour the disinfecting solution down the drain, taking care to avoid spills, splashes, or breathing the vapors.

4. **Rinse the emptied PAA container with tap water to remove all traces of the chemical.** Rinsing emptied containers is needed to protect waste handlers from accidental exposure to the chemical**.**

5. **Rinse the sink surfaces with tap water to remove residual disinfecting solution and to flush the chemical from the sink traps.**

6. **Discard the emptied and rinsed container in a waste receptacle or set aside for recycling.**

7. **Inspect the area for spilled or dripped disinfecting solution. Wipe up small spills with a damp paper towel. Larger spills should be either flushed to drain with water or removed with a water bucket and floor mop.**

WARNING: Verify that there is no chlorine (bleach) in the water bucket or floor mop. Chlorine (bleach) will cause a severe chemical reaction when it comes in contact with hydrogen peroxide/peroxyacetic acid concentrate!

8. **Rinse rubber gloves with tap water to remove any residues from handling.**

9. **Remove and return rubber gloves, apron, and goggles to their storage area.**

11.3 SILEX DISINFECTION

1. Turn off the water supply to the Silex system and remove the discharge from the storage tank.

2. Remove the resin packs from the system.

3. Pour 5 oz (150 mL) of PAA into each Silex column.

4. Close all drain valves and sample ports and open the air vents located in the center of the top plates.

5. Turn on the water supply to the Silex and allow it to fill with water until the presence of PAA can be detected at the outlet of the system. Verify the concentration of PAA at the outlet using a high level concentration PAA test strip (P/N 9778339-000).

6. Turn off the water supply and allow the system to soak for 1 hour.

7. After the soak time, drain the water out of the system by placing a container under the drain valves and opening the valves.

8. Close all valves and turn on the water supply to the system.

9. Direct the product water to a drain and allow system to flush until PAA is no longer detected. (Use low-level PAA test strips, P/N 9778338-000, to test for residual PAA).

10. Drain the water out of the system by placing a container under the drain valves and opening the valves.

11. Close all drain valves and sample ports and open the air vents located in the center of the top plates.

12. Replace the resin packs and return system to service.

11.4 TANK DISINFECTION

Storage Tank Disinfection Procedure:

1. The storage tank can be disinfected using household bleach or a peracetic acid disinfectant (PAA).

WARNING: Never allow Chlorine (bleach) to come into contact with PAA. Doing so will cause a severe chemical reaction!

   a. For a 55 gallon tank, fill to the RO shut-off level mark and add 1 quart of household bleach or PAA.

   b. For a 100 gallon tank, fill to the RO shut-off level mark and add 2 quarts of household bleach or PAA.

2. If your system is installed with a recirculation loop back to the storage tank, recirculate the system for 30 minutes.

3. If your system is a demand feed (where the pump only operates when your equipment calls for water), connect the bypass hose to the quick disconnect and place the other end of the bypass hose into the storage tank, recirculate for 30 minutes.

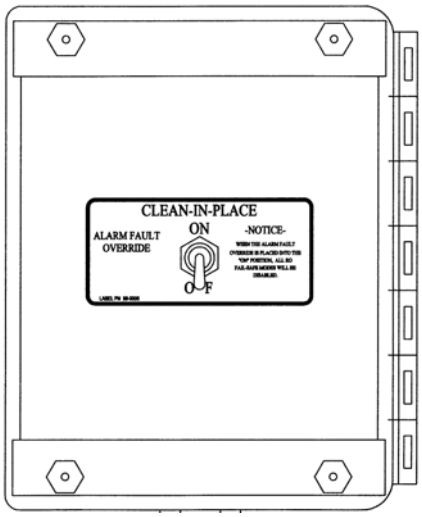
4. After recirculation, drain the tank, fill with RO water, and recirculate for 5 minutes.

5. Drain and refill the tank, and recirculate for 5 minutes. Use a chlorine test strip to verify the residual chlorine level or a PAA test strip to verify the residual PAA level.

6. Repeat step 4 and 5 until the test strip indicates a residual level at or below 1.0 ppm.

SECTION 12, CLEAN IN PLACE (CIP)

1. Move the CLEAN IN PLACE SWITCH (inside the RO on the back of the controller) to the ON position.



To avoid electrical shock, <u>always</u> unplug the RO system before opening the access panel or the face of the electrical controller.

2. Place the FLUSH VALVE in the FLUSH position.

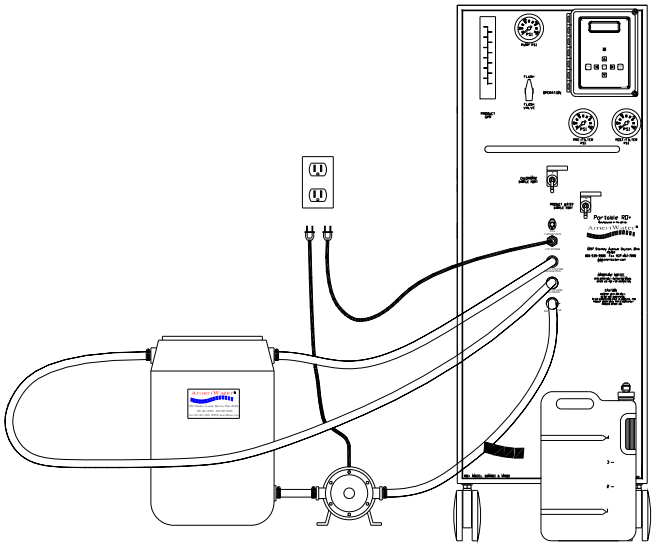
3. Connect the RO PRODUCT WATER hose to the PRODUCT RETURN connection (female garden hose thread) on the CIP Cleaning Drum.

4. Connect the RO REJECT TO DRAIN HOSE to the REJECT RETURN connection (hose barb) on the CIP Cleaning Drum.

5. Connect the RO INCOMING TAP WATER HOSE to the CIP PUMP OUTLET (male garden hose thread).

6. Leave the micron filter in the filter housing, but remove the carbon block.

7. Add 1 cup of AmeriClean B (base cleaning) to the CIP Cleaning Drum and fill with RO water (if available). Stir until dissolved.



8. Plug in the CIP Pump and turn on the RO. Verify recirculation flow inside the cleaning drum.

9. Allow the system to recirculate the cleaning solution for 30 minutes.

10. Turn off the RO and the CIP Pump. Allow the system to soak for 30 minutes.

11. Turn on the RO and CIP Pump and allow them to run an additional 5 minutes.

12. Turn off the RO and CIP Pump.

13. Disconnect the RO REJECT TO DRAIN HOSE and direct it to a drain.

14. Turn on the RO and CIP Pump and run to drain until the CIP Cleaning Drum is emptied.

15. Turn off the RO and CIP Pump and fill the CIP Cleaning Drum with approximately 2

gallons of clean water.

16. Connect the RO REJECT TO DRAIN HOSE to the REJECT RETURN connection on the CIP Cleaning Drum.

17. Turn on the RO and CIP Pump and allow the water to recirculate for at least 1 minute.

18. Turn off the RO and CIP Pump and disconnect the REJECT TO DRAIN HOSE from the CIP Cleaning Drum. Direct the REJECT TO DRAIN HOSE to a drain.

19. Turn on the RO and CIP Pump and continue running to drain until the CIP Cleaning Drum is emptied.

CAUTION: Verify that the AmeriClean B has been thoroughly rinsed from the system prior to proceeding to the next step. Mixing the chemicals may result in an exothermic reaction that may damage the RO+ system.

20. Repeat steps 7 to 19 using AmeriClean A (acid cleaning) and then proceed to step 21.

21. Disconnect the RO hoses from the CIP system and run the PRODUCT WATER hose and REJECT TO DRAIN hose to a drain. Connect the INCOMING TAP WATER hose to a water supply.

22. Replace carbon block filter and replace micron filter, if necessary.

23. Turn on the feed water supply and the RO, and allow running for 10 minutes.

24. Turn the TEMPORARY FLUSH VALVE to the OPERATION position, and continue running to drain until the conductivity drops below the setpoint (not in alarm).

WARNING: DO NOT place the RO in service until all operational parameters are within specification. Consult the STARTUP LOG to verify that all specifications are met.

SECTION 13, TROUBLESHOOTING GUIDE

WARNING: Only those persons who have read the complete operations manual or who have received authorization from the medical facility director should attempt to troubleshoot and/or repair the RO+ system.

NOTE: At times it may become necessary to replace parts on your RO. AmeriWater stocks all parts and components for the system, and can ship the necessary replacement parts to you if you call Customer Service at 1-800-535-5585 between 8:00 a.m. and 5:00 p.m. EST.

To assist you in quickly restoring your system into service, AmeriWater will send your replacement part out immediately and check your bad part when it comes in to verify if it is covered under your equipment warranty.

PROBLEM	POSSIBLE CAUSE	CORRECTIVE ACTION
RO will not start	RO not plugged in	Plug into electrical outlet.
	Circuit breaker blown	Reset the breaker.
	RO in a FAULT condition	Check RO controller display for FAULT condition and correct the FAULT.
System has power but no water flow	Feed source not open	Open Incoming Tap Water valve.
	Feed pressure < 20 PSI	Increase pressure to ≥ 20 PSI.
	Incoming hose kinked	Straighten kinks from the INCOMING TAP WATER hose.
	Prefilter clogged	Check the prefilter gauges for pressure drop; replace the carbon blocks if the pressure drop is 15 PSI or greater.
	Circuit board relay is not operating	Replace the controller circuit board
	Feed solenoid is not operating	Test the solenoid. Replace the valve if it is defective.

PROBLEM	POSSIBLE CAUSE	CORRECTIVE ACTION
Low product flow rate	Low pressure feeding membrane	Verify that the incoming tap water supply is fully open. The pressure on the prefilter gauges should be ≥ 20 PSI when the RO is operating.
	Low pump PSI	Pump should be operating at 100 – 180 PSI.
	Reject GPM flow rate too high	Turn FLUSH VALVE to the IN SERVICE position.
	Excessive PRODUCT line backpressure	Check for restrictions in the PRODUCT WATER hose.
	Relief valve has failed shut.	Replace the relief valve.
	Low temperature incoming tap water	Consult the Temperature Correction to determine if the flow rate is normal in relation to the feed water temperature.
	Prefilter clogged	Check the prefilter gauges for pressure drop. Replace the prefilter and carbon block cartridges if the pressure drop is ≥ 15 PSI.
	Membrane needs replaced	Replace the membrane.
Disinfect cycle will not operate when holding the ENTER key	DISINFECT MODE has not been accessed correctly.	Access DISINFECT MODE
	Circuit board relay not operating in DISINFECT MODE.	Replace the controller circuit board.
	Disinfect Solenoid Valve not operating	Test solenoid valve. Replace the valve if it fails.
Pressure fault	Low incoming pressure to the system	Verify that the incoming pressure to the system is above the minimum requirements.

PROBLEM	POSSIBLE CAUSE	CORRECTIVE ACTION
RO Pump making excessive noise	Low pressure or flow rate feeding the RO	Check the prefilter outlet gauge PSI (must be ≥ 20 PSI), and verify that the product flow (flowmeter) > 0.4 GPM.
	Feed solenoid is not operating	Test the solenoid. Replace the valve if it is defective.
	Pump motor or impeller failing	Check PUMP PSI GAUGE to verify that it is within operating parameters. Replace the pump assembly if necessary.
Poor quality product water	High Chlorine levels	Replace the Carbon Cartridge filter.
	RO not rinsed thoroughly	Rinse membrane.
	FLUSH VALVE in the FLUSH position	Put the FLUSH VALVE in the IN SERVICE position.
	Fouled membrane	a. Exchange all water treatment components. b. Check and correct the antiscalant system. Verify the conductivity cell accuracy with a known good meter. Follow the calibration procedures or replace cell if necessary.
	Anti-scalant not working	Verify anti-scalant system is in operation.

RO2 CONTROLLER TROUBLESHOOTING

CAUTION: Hazardous voltages are present when power is applied to the unit. Care should be taken when troubleshooting any of the input power or output circuits. When disconnecting or connecting any board or accessory, be sure power is unplugged.

Before contacting AmeriWater for technical help, verify the programming of all Setpoints, check the display and check the status of all lights and indicators. The more information available when you contact us, the easier it will be to determine the source of the problem. Standard setpoints, and drawings of the controller and pc boards can be found in Section 10.0, RO2 Controller.

PROBLEM	INVESTIGATION	CORRECTIVE ACTION
System Inoperative	Is the yellow CPU active LED blinking?	If power is applied to the power terminals and the other checks are OK, the pc board is defective and should be replaced.
	If no, is the green power LED, DS1 Lit?	
	If no, is the fuse OK?	If no power is applied to the board, check the power wiring to the system.
	If no, replace the fuse.	
	If yes, with a voltmeter, verify power is applied to the power terminals L1 and L2.	
Display Blank	Is the green power LED, DS1 lit?	If no, refer to the system inoperative section.
	If yes, is the CPU active LED, DS9 blinking?	If no, replace the board.
	If yes, adjust the display contrast adjustment, R3. Is the display still blank?	If yes, replace the board.
Inlet Valve Will Not Operate	Is the system in standby?	
	If no, are any shut down conditions active?	
	If no, is the inlet LED, DS8 lit?	If no, replace the board.
	If yes, with a voltmeter, verify if there is power on the inlet terminals. Is there power?	If no, replace the board. If yes, check the valve and wiring.

PROBLEM	INVESTIGATION	CORRECTIVE ACTION
RO Pump Will Not Operate (Cont.)	Is the system in standby?	
	If no, are any shut down conditions active?	
	If no, is the RO LED, DS6 lit?	If no, replace the board.
	If yes, with a voltmeter, verify if there is power on the RO pump terminals. Is there power?	If no, replace the board. If yes, check the pump and wiring.
No or incorrect conductivity reading	Is sensor wired correctly?	If no, correct wiring.
	If yes, is sensor installed inline?	If no, install correctly.
	If yes, verify correct Conductivity range. Range correct?	If no, correct range.
	Does unit calibrate OK?	If yes, calibrate unit.
	If no, disconnect green and white wires of sensor. Does reading show 0?	If no, replace board.
	If yes, reconnect wires and remove sensor from piping and dry. Does reading show 0?	If no, replace cell.
	If yes, short terminals of cell together. Does reading show '^^^' ?	If no, replace board.

SECTION 14, SPARE PARTS LIST

Consumables

Part #	Name
002101C	Regeneration Certificate, Standard DI
20-5102	Carbon Block Filter (10 micron block, 2.5” X 20”)
95-0013	Peracidin Disinfectant, 4 Gallons
95810125	PT401 Antiscalant, 4 Gallons
97HP20401	High Range Peracetic Acid Test Strips
97PX20501	Low Range Peracetic Acid Test Strips
R22-4026	Membrane

Replacement Parts

Part #	Name
0013-0001	O-Ring Kit for 21-0032 Filter Housing (20”)
0119-0007	Drain Port Assembly
0119-0008	Drain Tee Assembly
0119-0010	Column Assembly
19300001-00	Column O-Ring
19530901	Air Vent
19560310	Knob Assembly
21-0032	Filter Housing(20”)
24-0026	Membrane Housing O-Ring Set
43-0017	0 – 100 PSI Pressure Gauge
43530701	0 – 60 PSI Pressure Gauge
43530714	0 – 300 PSI Pump Pressure Gauge
67511004	Floatswitch
66932109	Wire Harness for Solenoid Valves
75679118	Resistivity High Trans with Patch
75679122	Hydro-Check, 200K Light with Alarm
92-0042	Hilti Anchor
94-0013	DI Polisher, Caster, Twin Wheel with Brake
94-0014	DI Polisher, Caster, Twin Wheel no Brake
R45760200	Mini-relief Valve
R59-0002	Normally Closed Solenoid Valve
R59-0006	Normally Open Solenoid Valve
R65511105	Incoming Pressure Switch
R69446010	Controller
R80-0002	MQ Distribution Pump
R80-0125	RO Pump Assembly
R84-0002	PT401 Pump Assembly